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Report details competitive threat to U.S. companies

Some U.S. generation system suppliers may not survive

WASHINGTON—Manufacturers of power generation equipment—primarily fossil and nuclear steam generation systems and turbine-generators—are in for hard times in the next decade and not all will survive, a new Department of Commerce report concludes. However, the report says, "some U.S. production capacity should survive until demand improves," depending on their success in developing repair and maintenance services, adapting to new technological opportunities (such as cogeneration) and marketing in developing nations.

But substantial obstacles stand in the way of achieving each of these three survival requirements, the report says.

Pointing out that "To remain viable, the domestic generating equipment industry must maintain technological leadership and provide utilities with equipment to generate electricity less expensively than equipment offered by offshore manufacturers, the report warns that manufacturers must do so at a time when demand for new units is at record low levels with little likelihood of an increase before the mid-1990s.

Without sufficient orders generating adequate revenues to encourage companies to maintain a high level of research and development, the report concludes it will be difficult for U.S. generation equipment manufacturers to maintain the technological edge necessary to compete effectively.

Titled "A Competitive Assessment of the U.S. Electric Power Generating Equipment Industry," the report presents a dark picture of the future for power generation equipment manufacturers. Even so, it is a much watered-down version of the original draft, sources say.

Report concludes

The report concludes with options the federal government could exercise to enable the generating equipment industry to improve its viability and survive. These options range from broader financing assistance via the Export/Import Bank and AID programs to substantial protective alternatives, including strengthening the "Buy American Act," encouraging manufacturers to pursue anti-dumping cases, restricting foreign supplier access to the electric utility market for generating equipment unless the domestic markets of those offshore suppliers are opened equitably to U.S. suppliers and the like.

The U.S. is still the world leader in production and consumption of electricity and in 1984 installed U.S. generating capacity was 31 percent of total world capacity. But, according to the DOC report, the U.S. share of world power generating equipment exports has eroded from 21.3 percent in the 1955-1975 period to 12.5 percent in the period since 1975. Furthermore, the U.S. share of the world turbine-generator market declined from 51.3 percent in the 1970-1973 period to 45.4 percent in the 1978-1981 period.

At the same time, offshore suppliers have made substantial inroads in the U.S. market for power generation equipment, increasing to 43 percent of the U.S. hydropower generator market and 10 percent of the U.S.

Continued on page 5

State Supreme Court denies recovery of Bailly-1 cost

INDIANAPOLIS—Northern Indiana Public Service Co. (NIPSCO) will not be allowed to recover its $191 million investment in a nuclear plant it cancelled four years ago, ruled the Indiana Supreme Court Nov. 19.

Upholding an appeals court decision, the Supreme Court ordered the Indiana Public Service Commission by a 3-2 vote to vacate a 1982 order allowing the utility to recover the costs for its cancelled Bailly-1 nuclear unit.

In a dissenting opinion, Judge Dixon W. Prentice wrote, "Not only do I regard the decision of the majority to be in gross error, as a matter of law, I believe the result to be a societal disaster. Capital for utility companies subject to the law of this case will, in my judgment, be available only at extremely high rates—if at all. What have historically been regarded as conservative low risk securities will become highly speculative."

The court's decision may have an impact on Public Service Company of Indiana and how it attempts to recover the costs for its cancelled Marble Hill nuclear plant. The utility had been awaiting a decision in the NIPSCO case before proceeding.

According to the Supreme Court, Bailly-1 was never "used and useful" property. NIPSCO argued that the amortization of the sunk costs for the unit is an allowable operating expense.

NIPSCO spokesman Phil Phelan said the Hammond, Ind.-based utility will file an appeal for rehearing with the state Supreme Court.

The utility has already collected $38 million over the past three years from ratepayers for Bailly-1. He explained that the money cannot be refunded until the appeals process is exhausted.

Dividend stopped

In addition, the NIPSCO Board of Directors voted on Nov. 26 to withhold the fourth quarter common stock dividend. Phelan said bankruptcy is not a threat at this time. He noted that about 10 to 12 percent of NIPSCO's workforce has been laid off over the past few years and that cost-cutting measures have been in effect.

A construction permit for the 644 MW, Bailly-1 was obtained in 1970. At that time the plant was expected to be completed in six years for a cost of $187 million.

When the plant was cancelled in August 1981, approximately $191 million had been spent and one percent of the unit had been constructed.

Over at Public Service Co. of Indiana (PSI), spokeswoman Chris Combs said the utility is studying options to recover its $2.5 billion investment in the cancelled Marble Hill plant.

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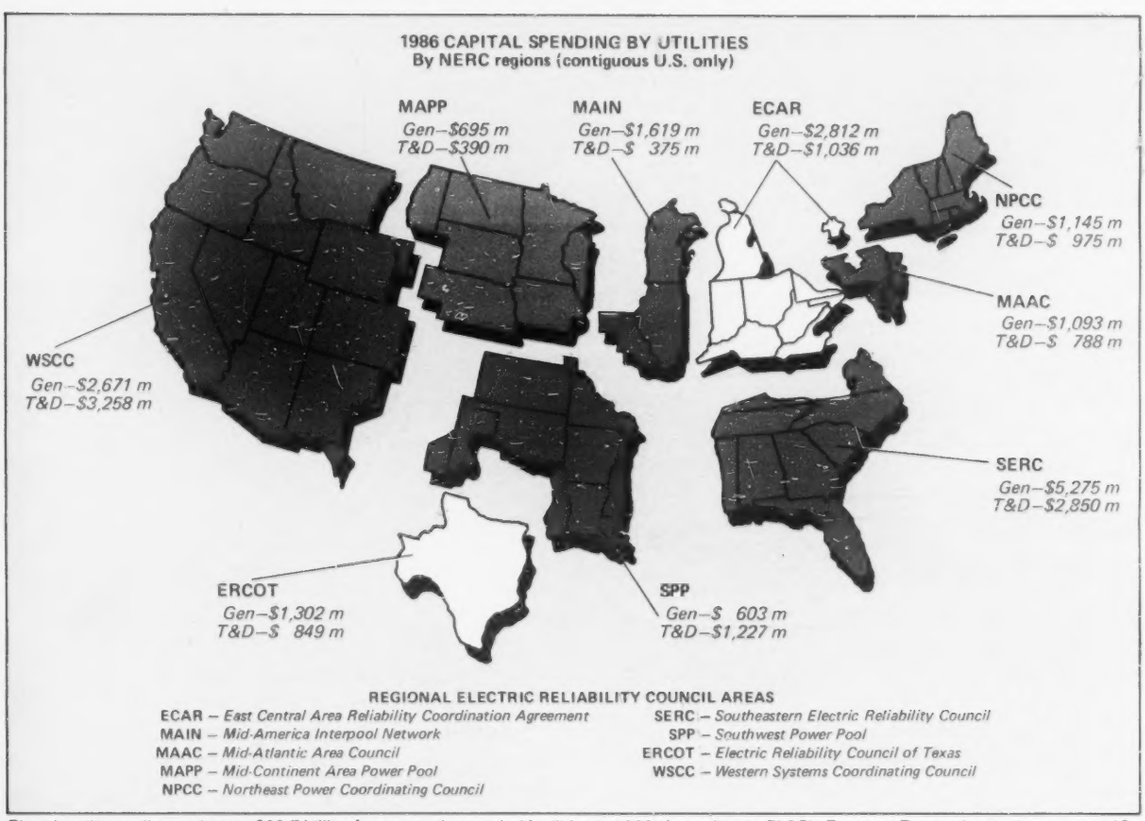
Where electric utility capital spending will take place in '86



Electric utilites will spend some $30.7 billion for new and upgraded facilities in 1986. According to *EL&P*'s Forecast Report, beginning on page 13, industry capital invesment will decline steadily through 1990.

News Briefs

DON MINNER, Associate Editor

Edison's nuclear program pushed back

● Commonwealth Edison Company pushed back the completion dates for its three nuclear units still under construction. The utility said Braidwood-1 (90% complete) will now be in service by May 31, 1987, instead of the previous date of Oct. 1, 1986. Braidwood-2 (60%) is now scheduled for service by Sept. 30, 1988, instead of Dec. 31, 1987. The schedule for Byron-2 was postponed eight months until May 31, 1987. Edison also revised the total construction cost estimates for the units. The Braidwood station estimate rose from $4.11 billion to $5.05 billion, while the price tag for the Byron station went up to $4.65 billion, from the previous estimate of $4.18 billion. When the project began in 1973, Edison said it would cost $934 million to build the Braidwood units. Also in 1973, utility officials estimated the Byron station could be completed for $902 million. In October, the utility announced a new austerity program that included an examination of its construction program. Commonwealth Edison said preliminary results indicate that completing the units under construction as soon as possible is still the lowest cost alternative. "Our plan is to get the three remaining units in our construction program up and running as soon as possible," said Edison Chairman and President James J. O'Connor.

Cost for Comanche Peak rises almost $1 billion

● A reinspection and reanalysis of the two-unit Comanche Peak nuclear plant shows that it will take almost $1 billion more to complete than the last estimate, said Texas Utilities. The utility said it will cost $5.46 billion, including Allowance for Funds Used During Construction, to put Unit 1 into commercial operation in mid-1987 and Unit 2 on-line six months later. Texas Utilities had estimated in January 1985 that the plants would cost $4.56 billion. That estimate was based on a commerical operation of Unit 1 in early 1986 and Unit 2 in mid-1987. The reinspection was undertaken in response to safety questions raised in the licensing process. Texas Utilities Electric Co., the electric subsidiary, owns about 88 percent of the plant. The remaining share is owned by Texas Municipal Power Agency, Brazos Electric Power Cooperative, Inc. and Tex-La Electric Cooperative of Texas, Inc. In the new estimate, Texas Utilities Electric's share rose to $4.64 billion, from $3.9 billion.

West Valley contract extended

● The U.S. Dept. of Energy will extend the contract of the West Valley Nuclear Services Company for five years beginning Oct. 1, 1986. The company, a subsidiary of Westinghouse Electric Corp., operates the West Valley Demonstration Project. The firm will solidify 600,000 gallons of liquid high level radioactive waste. Beginning in 1988, the world's largest slurry fed ceramic melter will begin converting nuclear waste to borosilicate glass.

Northwest Energy buys three firms

● Northwest Energy Services Co. (NESCO), a joint-venture owned by the four Pacific Northwest investor-owned utilities, recently announced the acquisition of three new subsidiaries. NESCO bought Engineering and Design Associates in Oregon; Continental Power Resources Co. in New Jersey; and B.C. Power Services in Washington. Craig Davies, president and chief executive officer of NESCO, said, "These three companies give NESCO full-service engineering, construction and maintenance capability. Our potential is enormous and our commitment to fullfilling that potential is unwavering." The firm is owned by Pacific Power & Light, Portland General Electric, Puget Sound Power & Light and Washington Water Power.

Consumers Power studies Midland conversion

● Consumers Power Company will study options for utilizing its mothballed $4 billion Midland nuclear plant. William T. McCormick, Jr., the new chairman and chief executive officer of the utility, said the study will consider several non-nuclear conversion options, including a combined-cycle natural gas plant and a coal-fired plant. "I wish to emphatically state that the new management of Consumers Power is not committed to a nuclear completion of Midland," he said in a prepared statement. "In fact, for a variety of political and financial risk reasons, at the present time, the nuclear completion option may be the least viable of the several major options." The state public service commission told the utility to go ahead with the study if it were done internally.

TVA shuffles nuclear program

● Prompted by the shutdown in August of its Sequoyah nuclear plant and a number of Nuclear Regulatory Commission fines, the Tennessee Valley Authority has announced new management controls for its overall nuclear program. TVA submitted the information to the NRC in order to show the plant is ready for safe operation. "I believe we're submitting a solid package of information to the NRC that demonstrates the necessary actions have been and are being taken in order to resume operation of Sequoyah," said Hugh Parris, TVA Manager of Power and Engineering (Nuclear). The TVA Board of Directors said it will hire a senior nuclear advisor and hold special board briefings dedicated solely to the nuclear program. Also, TVA announced that nuclear safety review staff senior representatives will be assigned full-time to individual plant sites. An Office of Inspector General, with broad investigative and reporting powers, will be created to receive employee concerns about nuclear activities. TVA also took several other management restructuring steps to shore up its nuclear program. Both Sequoyah units were ordered shut down by TVA because significant deficiencies were discovered in the documentation of environmental qualification of safety-related electrical equipment.

B&W, China form joint venture

● Babcock & Wilcox International in Ontario and Beijing Boiler Works of Beijing, China have agreed to form a new joint venture called Babcock & Wilcox Beijing Co. (China) Limited. B&W said the agreement was signed in October after almost two years of negotiations. The first contract for the new company is expected to be a 200 MW boiler for the Xin-Hai Power Project in the Jaing Su province. First shipments are expected to begin in 1987. According to B&W Canada, ten B&W representatives will be stationed in Beijing to help coordinate the expansion of two-thirds of the existing Beijing Boiler Works facilities. Training of Chinese personnel will take place over the next three years at sites in the U.S., Canada and China.

Don't sell Conrail, says Reed

● "Now is not the time to turn our backs on competition," warned Conrail President and Chief Operating Officer Stuart M. Reed. Speaking at a Cincinnati Coal Exchange meeting in November, he predicted that a sale of Conrail to Norfolk Southern Corp. would inhibit competition in the railroad industry. "The export outlook for coal is more positive than it has been," noted Reed, "and coal's share of U.S. energy has made gains during the last decade." He told the group that Conrail has been profitable each year since 1981, including a $500 million net income in 1984 and $330 million net income for the first nine months of 1985. Reed said, "There is no such thing as a captive coal mine because the coal mine operator and the railroad work as partners to capture business to their mutual benefit. The bottom line is that when you (as producers) make money, we make money. When you lose an order, we lose that freight business. We are a competitive threat even if we do not serve your mines. We keep the CSX and Norfolk Southern on their toes."

Elderly customer training program developed

● In an effort designed to enhance the electric utility industry's ability to serve the elderly, the Edison Electric Institute said it has developed an Elderly Customer Awareness Training Program. EEI, along with the American Association of Retired Persons and the Center for Studies in Aging at North Texas State University, designed the program to help utilities and their older customers address the needs of the fastest growing segment of the U.S. population. Mary Ann Bernald, EEI's manager of consumer affairs, said, "This program will assist electric utility employees in recognizing and understanding the physical, social and psychological needs and values of older customers. The program will teach improved communication skills to foster better understanding and to increase sensitivity to the needs and problems of the elderly."
According to EEI, approximately one of every nine Americans is aged 65 or older. The program features a 30-minute introductory videocassette tape which explains the various methods of dealing with elderly customers. For more information on the program, call Bernald at (202) 828-7506.

Testing completed at Seabrook

● New Hampshire Yankee announced the successful completion of a month-long test sequence designed to demonstrate the plant's ability to generate electricity. New Hampshire Gov. John Sununu said the completion of "hot-functional" testing shows that Seabrook will play a significant role in meeting the future energy needs of New Hampshire and New England. New Hampshire Yankee Senior Vice President William B. Derrickson said, "Late spring, we will be ready to load fuel into the reactor and, less than a year from now, this plant will be ready for commercial operation." During the testing, Derrickson said the plant produced and distributed electricity three times.

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EL&P readers whose responsibilities include both Generation and Transmission/Distribution receive both technology sections. Other readers receive the technology section that applies to their respective area of responsibility. The Generation edition is indicated by a single dot (●) in the upper right corner of page 1, the T/D edition carries two dots (●●). All readers receive EL&P's industry news section.

BG&E says EPZ for Calvert Cliffs should be reduced

BALTIMORE—Baltimore Gas & Electric Co. wants to cut its emergency planning zone (EPZ) around its Calvert Cliffs nuclear plant from 10 miles to two miles.

The utility filed a petition for the reduction in November with the Nuclear Regulatory Commission (NRC). Every large light water reactor plant is required by the NRC to have an EPZ with an area of approximately 10 miles in radius surrounding the plant.

If a plant can show good cause, the NRC rules allow exemptions.

BG&E asked the commission to approve a reduction based on information taken from studies done by the utility and the NRC.

Rich Olson, principal engineer for nuclear licensing and analysis at BG&E, said recent source term data from the NRC, the American Nuclear Society and others were used by BG&E to determine that a two mile emergency planning zone radius would be adequate.

Risk overestimated

According to BG&E, the studies show that previous data overestimated the risk of a major radioactive release to the environment. In the case of the two-unit, 1650 MW Calvert Cliffs plant, BG&E said extensive analysis of the most severe theoretical accident conditions show that exposures that were previously thought to occur at 10 miles would not occur beyond two miles from the plant.

"We are confident, from comprehensive scientific studies, that the releases from a major accident at the Calvert Cliffs plant would be nowhere near what had been previously projected," stated BG&E Vice President of Engineering and Construction Joseph A. Tiernan. "The Calvert Cliffs plant design, and this body of new data lead us to believe that a two mile EPZ is a more realistic planning zone."

Tiernan noted that the proposed EPZ reduction would not compromise the effectiveness of the emergency planning efforts of the company, Calvert County or surronding political sub-divisions.

According to 1980 census data, approximatley 35,000 people would fall with in a 10 mile radius of the plant and about 500 would be encompassed by a two mile zone.

Modest cost savings

Olson denied that the utility wants to reduce its EPZ for financial reasons. He said BG&E would only realize a modest cost savings of between $30,000 and $50,000 per year.

"We simply feel that the ten mile zone is an unduly pessimistic characterization of Calvert Cliffs," stated Olson. "The plant is not dangerous."

He said the public perception of the plant is bad, because the 10 mile zone implies that the entire area inside the EPZ is dangerous. BG&E believes that a reduction of the zone could improve the public's perception of the plant.

NRC spokesperson Sue Gagner said BG&E is the first utility to request an exemption to the regulation requiring a 10 mile EPZ. She pointed out that two nuclear have five mile EPZs, because of their smaller size.

Gagner said the NRC staff is studying BG&E's request.

Industrial equip. sales look strong in '86:manufacturers

VANCOUVER, B.C.—Light construction and industrial equipment sales in 1986 should hold steady at their current pace, say leading manufacturers.

In outlook statements prepared for the Farm and Industrial Equipment Institute (FIEI), the manufacturers said the strong performance of the housing market, affordable mortgage interest rates, and continued state and federal spending on construction projects are some of the reasons for their optimistic feelings.

Sales to electric utilities and telecommunications firms should be strong in 1986, noted Stelco Co. President Wayne R. Stallard.

"Our assessments reflect a commonly-held judgment that the electric utilities will have strong cash flows...providing our customers with cash," predicted Stallard.

Charles Machine Works President Edwin Malzahn believes industrial and construction equipment sales will remain near 1985 levels. He also said that manufacturers will continue to rely on overseas sources for components and machines.

"It may say 'Made in the U.S.A.' on the outside, but the chances are most of it had a long boat ride," said Malzahn.

J.I. Case President Jerome K. Green predicted, "Construction equipment markets are nearing peak levels in the current recovery cycle. Demand for construction equipment is expected to remain steady through the remainder of 1985, then decline slightly."

Massey Ferguson Ltd. Chairman and Chief Executive Officer Victor A. Rice looks forward to continued "modest growth" in the industrial machinery market next year.

He said, "Construction—mainly residential—in North America has responded strongly to the business cycle upturn that began in North America."

River Bend licensed

WASHINGTON, D.C.—A full-power operating license for unit 1 of the River Bend Nuclear plant in Louisiana was issued by the Nuclear Regulatory Commission in November.

The plant, which is owned by Gulf States Utilities and Cajun Electric Power Cooperative, uses a boiling water reactor and will be capable of generating 991 MW.

NEMA predicts gloomy business climate in '86

SAN FRANCISCO—It looks like a gloomy 1986 for U.S. electrical manufacturers.

According to the National Electrical Manufacturers Association (NEMA), the nation's electrical manufacturers expect only slight growth this year.

In its year-end poll of the NEMA membership, the group determined that most sectors of the industry would be running well behind the current real GNP growth rate in 1986.

Unfavorable direction

NEMA President Bernard H. Falk, speaking at the association's annual meeting, said, "Until this year, NEMA product shipments have been pretty well tracked with the economy as a whole. No longer. We've broken the pattern—in a decidedly unfavorable direction."

The association said the 1985 figure of 0.06 percent reflects a substantially lower expectation for the year than previously projected (See chart). For 1986, the NEMA survey projects 1.8 percent real growth.

Electrical building equipment manufacturers are predicting a 0.6 percent growth in 1986. While the poll shows, power equipment manufacturers expect a growth of only 1.3 percent next year.

Manufacturers of lighting equipment believe 1986 will be better than 1985—3.2 percent growth versus 1-1/2 percent this year. NEMA said members of the ballast section expect sales to be up 3-1/2 percent in 1986.

PROJECTED INDUSTRY SHIPMENTS (IN REAL TERMS)* FOR THE ELECTRICAL MANUFACTURING INDUSTRY**
Summary 1985-1986

Product category	1985 % Change in sales from 1984 - projected Oct. 1985	1986 % Change in sales from 1985 - projected Oct. 1985
Lighting equipment	+ 1.5	+3.2
Electronic equipment	+ 2.8	+4.5
Industrial equipment	- 1.4	+0.7
Building equipment	+ 4.6	+0.6
Insulating materials	- 4.9	+0.8
Wire and cable	+ .06	+1.9
Power equipment	+ 3.0	+1.3
Diagnostic imaging & therapy systems	-10.5	+1.8
Total industry	+ .06	+1.8

*Including interplant transfers and exports.
**Projection only covers products within the scope of NEMA. Typical products in the scope of each product category are listed on the sheets attached.
Source: NEMA Statistical Department

Insulated electrical and electronic wire and cable manufacturers said they anticipate coming out of a flat 1985 with almost two percent growth next year.

The manufacturing of electric insulating materials, which was expected to drop 4.9 percent in 1985, will rise only 0.8 percent this year.

"We are being beaten too often by foreign competitors," said Falk. "The problems of electrical companies have never been as glamorous or as eye-catching as textiles or wheat or shoes or consumer electronics. Our overall trade surplus with the rest of the world, lost only recently, camouflaged the dangers in the declining balance of trade."

NEMA said that declining sales for motors and arc welding more than absorb the slight gains expected by industrial control makers.

Concluded Falk, "In 1985 we fell below the line and the downward trend continues. The high value of the dollar, a sluggish world economy and international protectionism all frustrate the competitiveness of American electrical manufacturers."

Shareholders approve Toledo Edison/CEI merger

CLEVELAND—Shareholders of The Cleveland Electric Illuminating Co. (CEI) and Toledo Edison Co. voted in November to approve the merger of the two companies.

Centerior Energy, the new holding company, will be among the nation's 20 largest electric utilities, with total assets of about $8.4 billion. If approval was obtained from the Securities and Exchange Commission,the affiliation was to have taken effect Dec. 31.

In addition to Toledo Edison and CEI, Centerior said it will have a service company subsidiary. According to CEI, it will coordinate activities such as finance, engineering, management information services, purchasing and nuclear operations to result in greater efficiencies and long-term cost savings.

In documents filed with the SEC, CEI estimated that the merger would result in benefits equivalent to $90 million per year over the next 15 years.

CEI said in its report to the SEC, "This affiliation will result in a more broadly experienced, more highly skilled work force at all levels and will make possible improvements in reliability, efficiency and cost savings that will go beyond those identified, and in areas of operations not presently visualized specifically and beyond present ability to quantify."

CEI Chairman Robert M. Ginn, who will serve as president and chief executive officer of Centerior Energy, said details of how the companies will operate following the affiliation are being worked out by teams made up of employees from both companies.

"It will take some time to complete the Centerior Energy organization, consolidate many functions with Toledo Edison and work out staffing arrangements," said Ginn. "But we want to take whatever time is needed to do things right...and to accomplish what we set out to do."

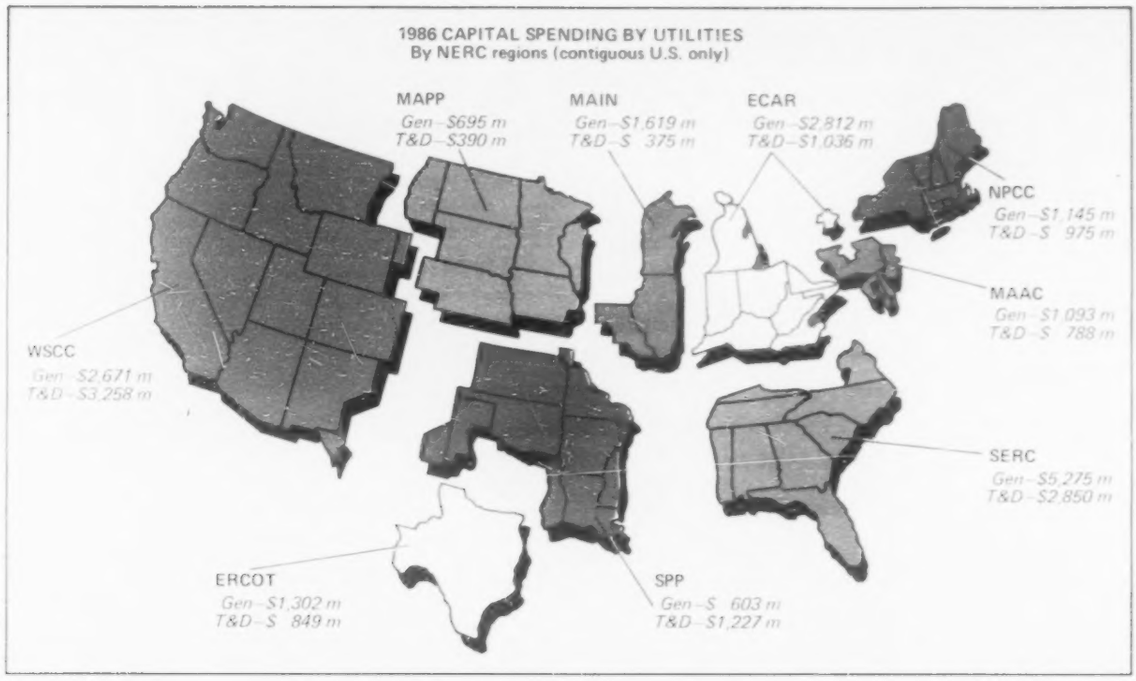
Toledo Edison Chairman and Chief Executive Officer John P. Williamson will serve as Chairman of Centerior Energy.

The merger of the two Ohio utilities was announced in June 1985.

PSE&G sells Eurobonds

NEWARK, NJ—New Jersey's Board of Public Utilities authorized Public Service Electric & Gas Co. (PSE&G) to sell up to $175 million in bonds in European debt markets.

PSE&G stated that the bonds will be used to help finance $775 million in planned construction expenditures this year, including $365 million for the Hope Creek nuclear plant.



Utilities to spend $30.7 billion in 1986, reduce 5-year total capital spending

Robert A. Lincicome, Editor-in-Chief
Robert W. Smock, Managing Editor
Donald F. Minner, Associate Editor

Electric utilities will continue to cutback investment in new facilities in 1986 and on through 1990, barring a substantial upturn in economic activity. Current high reserves of generating capacity are allowing most major utilities to postpone new generation system construction programs. The resulting cutback in capital requirements and improving financial conditions are allowing utilities to catch up with previously planned, but postponed distribution upgrading and expansion programs.

But potential effects of Congressional tax reform, legislation and regulatory developments could impact that development severely. And if domestic economic growth should accelerate to any degree, to 3.5 percent or higher from the current 2 percent rate, there are definite possibilities of electricity shortages on a number of major utility systems, which could lead to substantially stepped up generation construction activity beginning in 1988.

Strongest system expansion will take place in those areas currently enjoying the fastest population growth...namely the Southeast and West Coast ... and in the heavily industrialized East Central area that was hard hit by the last recession and is only now beginning its recovery.

These are the basic conclusions resulting from *EL&P*'s fall survey. The survey involved gathering data and information from more than 200 electric utility organizations, trade associations, government officials, industry leaders and analysts. It was completed in late November.

Capital spending in 1986

The electric utility industry plans to spend $30.7-billion for new and improved facilities in 1986. This represents an 11.5 percent decrease from planned capital investment in 1985 (actual figures for 1985 are not yet available). The decrease primarily reflects the electric utility industry's reaction to continuing generation system over-capacity, which has developed over the past four or five years as new generating plants have been completed and expected load growth did not materialize.

The industry will spend $17.2 billion for generation system construction in 1986. The cutback in planned generation investment for 1986 is 20.9 percent from 1985 and 24 percent below 1984 spending. Virtually all of the 1986 spending will go toward projects currently under construction or for upgrading or life extension work. While both of the latter presently involve more discussion than real action, they both are developing and by 1990 will represent a substantial portion of generation capital spending.

Spending for power delivery facilities is expected to total $11.7-plus billion, up just $36 million from 1985. This is made up of three catagories of investment: substations—$1.9 billion, transmission lines—$2.7 billion and distribution—$7.1 billion. Actually, more than $1.9 billion will be spent for substations since this figure is based solely on specific substation construction plans reported by utilities. A number of utilities reported that their substation investments were included with their transmission and distribution spending plans. Transmission and distribution spending is therefore overstated by the amount of the substation work included therein.

It is expected that transmission construction activity could begin to increase during the latter part of 1986 as utilities accelerate programs to strengthen and expand tie-lines to neighboring utilities and adjacent power pools so that they can take greater advantage of favorable power purchases from other sources and further postpone generation construction projects. Should they do so, transmission spending could increase by an additional 10-15 percent which would raise total transmission spending to more than $3.1 billion.

Distribution expansion will continue to be driven by residential construction and commercial activity. With the prospect of lower interest rates and stable prices in 1986, it is possible that housing starts could increase sharply during the last half of

Continued on next page

NORTH AMERICAN ELECTRIC RELIABILITY COUNCILS	
ECAR	East Central Area Reliability Coordination Area
ERCOT	Electric Reliability Council of Texas
MAAC	Mid-Atlantic Area Council
MAIN	Mid-America Interpool Network
MAPP	Mid-Continent Area Power Pool
NPCC	Northeast Power Coordinating Council
SERC	Southeastern Electric Reliability Council
SPP	Southwest Power Pool
WSCC	Western Systems Coordinating Council

1986 CAPITAL SPENDING BY NERC REGION (CONTIGUOUS U.S. ONLY)
(in $1000's)

Region	Generation	Substation	Transmission	Distribution	Other	Total
ECAR	$ 2,811,909	$ 122,145	$ 191,246	$ 722,584	$ 202,520	$ 4,050,404
ERCOT	1,301,530	14,909	174,026	660,453	113,206	2,264,124
MAAC	1,093,074	83,301	85,610	618,603	225,615	2,106,203
MAIN	1,619,346	62,588	66,654	245,409	70,429	2,064,426
MAPP	694,956	55,452	79,519	254,778	69,236	1,153,941
NPCC	1,145,279	97,048	151,485	726,476	127,217	2,247,505
SERC	5,275,267	580,176	700,548	1,569,563	546,329	8,671,883
SPP	602,584	197,324	336,288	693,177	96,283	1,925,656
WSCC	2,671,554	706,033	917,082	1,634,644	247,055	6,176,368
Total	$17,215,499	$1,918,976	$2,702,458	$7,125,687	$1,697,890	$30,660,510

CHANGING INVESTMENT PATTERN
1986 - 1990

	1986	1987	1988	1989	1990
Generation	56.1	52.1	47.3	49.3	49.8
T&D	38.4	43.3	48.2	46.5	46.2
Other	5.5	4.6	4.5	4.2	4.0
Total	100.0%	100.0%	100.0%	100.0%	100.0%

1986. If they should, distribution system expansion could surge, carrying over into 1987.

Miscellaneous system capital investment is projected at $1.7 billion, up $600 million, or 55 percent, from 1985.

Outlook through 1990

Beyond 1986, capital spending will continue to decline. By 1990, total capital expenditures are projected to be down to $20.1 billion. Annual capital expenditures are projected as follows: 1987—$26.9 billion, 1988—$24.0 billion, 1989—$21.0 billion and 1990—$20.1 billion.

During this period, spending for generation will decline steadily, from $14.0 billion in 1987 to $11.3 billion in 1988 to $ 10.4 billion in 1989 to $10.0 billion in 1990.

Spending for power delivery facilities will decrease also, from a high of $11.6 billion in 1987 to $9.3 billion in 1990. However, because generation spending will decrease more, proportionately, during this period, power delivery spending will represent a larger share of total spending. From 38.4 percent of total spending in 1986, power delivery investment will increase to 43.3 percent in 1987 and 48.2 percent in 1988 before dipping slightly to 46.5 percent in 1989 and 46.2 percent in 1990.

Miscellaneous capital spending will decline as a share of total capital spending from 5.5 percent in 1986 to 4.6 percent in 1987 and steadily to 4.0 percent in 1990. The decline in dollars is substantially greater, falling from $1.7 billion in 1986 to $1.2 billion in 1987 and ultimately to $814 million in 1990.

Faster growth, greater spending

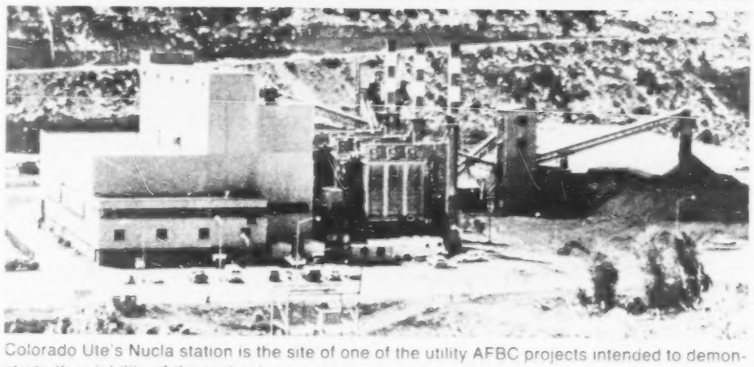
These projections are based on economic growth continuing through the period at a 2 percent per year rate. Should economic activity accelerate to the 3- or 3.5-percent level or higher, projected system requirements in 1988, 1989 and 1990 could lead to substantially increased capital spending across the board.

PROJECTED 5-YEAR CAPITAL EXPENDITURES
By NERC Region - in $ millions

Region	1986	1987	1988	1989	1990	5-Year total
ECAR	$ 4,050	$ 3,729	$ 3,501	$ 3,415	$ 2,613	$ 17,308
ERCOT	2,264	1,867	2,461	2,671	2,148	11,411
MAAC	2,106	1,947	2,103	2,008	1,584	9,748
MAIN	2,064	2,115	1,546	1,209	1,149	8,083
MAPP	1,154	1,142	876	890	920	4,982
NPCC	2,248	2,200	1,747	1,600	1,591	9,386
SERC	8,672	6,436	5,408	3,887	3,743	28,146
SPP	1,926	1,988	2,005	2,160	2,392	10,471
WSCC	6,176	5,474	4,364	3,203	3,964	23,181
Total	$30,660	$26,897	$24,012	$21,043	$20,104	$122,716

PROJECTED 5-YEAR CAPITAL EXPENDITURES
By Function - in $ millions

	1986	1987	1988	1989	1990	5-Year total
Generation	$17,215	$14,015	$11,364	$10,401	$10,010	$ 63,005
Substations	1,919	2,189	2,267	2,231	1,570	10,176
Transmission	2,702	2,856	2,639	2,034	2,010	12,241
Distribution	7,126	6,592	6,658	5,493	5,700	31,569
Other	1,698	1,245	1,084	884	814	5,725
Total	$30,660	$26,897	$24,012	$21,043	$20,104	$122,716



Colorado Ute's Nucla station is the site of one of the utility AFBC projects intended to demonstrate the viability of the technology.

SELECTED ALTERNATIVE GENERATING AND STORAGE TECHNOLOGIES: TYPICAL SIZES AND APPLICATIONS IN THE 1990s
Typical configurations in the 1990s

Installation size (MW)	Dispatchable applications[a] Base load (60-70% CF)	Intermediate load (30-40% CF)	Peaking load (5-15%)	Nondispatchable applications[b] Intermittent (w/o storage)	Others (not utility controlled)
Greater than 250 MWe	Coal gasification/ combined cycle	Coal gasification/ combined cycle	n.a.		
	Conventional coal				
51-250 MWe	Geothermal	Atmospheric fluidized bed combustor	Compressed air storage (maxi CAES)	Solar thermal	Atmospheric fluidized-bed combustor
	Atmospheric fluidized bed combustor	Compressed air storage (maxi CAES)	Solar thermal (w/storage)	Wind	Solar thermal (w/storage)
		Solar thermal (w/storage)			
	Combined cycle plants	Combined cycle plants	Combustion turbine		
1-50 MWe	Geothermal	Fuel cells	Compressed air storage (mini CAES)	Solar thermal	Atmospheric fluidized-bed combustor
	Atmospheric fluidized bed combustor	Compressed air storage (maxi CAES)	Battery storage	Wind	Geothermal
	Fuel cells	Solar thermal (w/storage)	Fuel cells	Photovoltaics	Fuel cells
			Solar thermal (w/storage)		Solar thermal (w/storage)
					Battery storage
					Compressed air storage (mini CAES)
					Geothermal
			Combustion turbine		Combustion turbine
Less than 1 MWe				Solar thermal	Fuel cells
				Wind	Battery storage
				Photovoltaics	

NOTES: For each unit size and application, new technologies are shown above the dotted line and conventional technologies are shown below the dotted line. CF = capacity factor and n.a. = not applicable.
[a] Dispatchable technologies may not be utility-owned.
[b] Note that nondispatchable technologies may serve base, intermediate, or peaking loads.
SOURCE: Office of Technology Assessment.

EL&P projections based on increased economic activity indicate that total spending would *increase* in 1988 to $27.0 billion and would fall only slightly, to $26.3 billion in 1989 and to $26.1 billion in 1990. Thus, for the five year period 1986-1990, total capital spending would run $137.0 billion, compared with $122.7 billion based on projected 2 percent economic growth.

Spending in all catagories would be increased (industry totals based on two-percent economic growth given in parenthesis for comparison). Generation spending would rise to $69.5 billion ($63.0 billion) for the five-year period. Power delivery capital spending would be as follows: Substations—$11.2 billion ($10.2 billion); Transmission—$14.0 billion ($12.2 billion); Distribution—$35.7 billion ($31.6 billion). Miscellaneous capital spending would total $6.6 billion ($5.7 billion).

Business environment

Utilities face an unsettling business climate in 1986 and beyond. This is in spite of conditions that in many ways are quite favorable.

On the one hand, kilowatthour sales are increasing steadily, if not dramatically. Revenues, net incomes and earnings for shareholders are up, stocks of investor-owned utilities are selling above book value again and rates of return for many utilities are at or near allowable limits. Utilities are generating more and more of their capital funds internally and borrowing requirements are down.

On the other hand, some utilities, essentially the ones with continuing or recently completed nuclear construction programs and who need to recover their enormous investments through rate relief, are under severe financial pressure. Many utilities — in fact, most utilities — face overcapacity problems, which are a special concern to regulatory agencies. Concurrently, state commissions are encouraging development of industrial cogeneration, which can reduce industrial demand and load at the very time that overcapacity already is a problem.

Utilities also are confronted with specific national legislative issues. For example, the matter of public power preference in hydro relicensing, modification of the Staggers Rail Act, nuclear licensing reform, renewal of the Price-Anderson Act, tax reform, acid rain legislation and transmission access are just a few of the issues of importance to utilities.

On the state level, the overcapacity problem could lead to state utility commission moves to counter the situation by deregulating electric utilities and letting competitive forces dictate price and rate of return. Prudency in management is another weighty concern for regulators and this, coupled with the industry's highly profitable performance in 1984 and 1985 could lead to strong downward pressures when utilities apply for rate increases.

Technological development

The rapidly developing fluidized-bed boiler is the highlight of the near-term outlook for technological change in the electric utility industry. This is a major modification of the standard coal-fired boiler. It offers low sulfur dioxide emission while burning high-sulfur coal without requiring a back-end stack-gas scrubber—making it enormously attractive to many utilities who are looking to coal as the fuel of the future.

This year and next will see the startup of prototype fluid-bed projects at Northern States Power

Continued on page 16

Energy secretary committed to nuclear power

SAN FRANCISCO—"Licensing and regulatory reform is perhaps the most crucial and essential step needed to restore the viability of the nuclear option," declared U.S. Energy Secretary John S. Herrington.

Speaking before the annual meetings of the Atomic Industrial Forum and the American Nuclear Society in November, Herrington outlined a five-point plan to restore nuclear power in America.

He told the audience that they need to:

- be better advocates for nuclear power.
- have licensing and regulatory reform.
- put in place a nuclear waste management system.
- press on with research and development.
- capitalize on the potential of foreign markets.

John Herrington

Committed to nuclear energy

According to the secretary, he and President Reagan are "irrevocably committed to nuclear energy as an option for our future."

Herrington said it is clear that a great deal of electric generating capacity must be added in the next decade.

"We developed the technology that the rest of the world has borrowed. And we have no intention of presiding over the demise of the American nuclear industry," he asserted. "We will not walk away from world leadership or contribute to a day when Americans will have a second-class nuclear industry."

Although the temptation is to place the blame for the U.S.'s nuclear problems on regulators and environmentalists, Herrington said industry must take its share of the reponsibility for the planning, management and construction problems plaguing nuclear power.

Herrington told the convention attendees to tell the public that nuclear power is safe, economical and necessary. Everything possible has to be done to show that the industry is operating nuclear units safely and reliably, he added.

Ease the stranglehold

Something has to be done, he said, to ease the regulatory stranglehold that the industry is suffering from.

"We simply must end this destructive practice of design-as-you-build, endless backfitting, and a licensing process which allows issues to be raised again and again even after they seem to have been finally resolved," Herrington told the ANS/AIF audience. "We must gain control of this process."

He said he will be pushing the administration's "one-step" licensing legislation this year. The bill would allow the Nuclear Regulatory Commission to approve, in advance, standardized designs and plant sites separate from a utility's application to construct a plant.

"I will urge the Congress to see the wisdom of a new and better approach to nuclear licensing," promised Herrington.

He expressed concerns over making sure the nation's electric utilities are never under capitilized.

"This can only be realized," he said, "if rate regulatory policies are farsighted and oriented toward providing the necessary incentives for efficient capital investment. North Carolina, Arizona, Virginia, South Carolina and Florida are among the states that have policies that recognize this need."

According to the energy secretary, the problem of nuclear waste is technically solved. "Now we need to tell the story," he said. "We need to educate the public so they will come to understand that nuclear waste can be handled, processed and disposed of in complete safety."

He assured the group that DOE is working to make certain that nuclear energy remains a future U.S. option.

DOE plans to support industry R&D by concentrating on simplification and standardization of plant design and simplification of operations.

He said the administration is looking for ways to remove foreign trade barriers to the nuclear power industry.

"Selling American technology abroad is good business," declared the secretary. "In these days of huge trade deficits we should vigorously exploit every opportunity to take part in nuclear developments abroad."

Capital spending . . . from page 14

and Colorado Ute. However, the rest of the utility industry has jumped the gun and is starting to order fluid bed systems on a commercial basis. Several preliminary orders have been placed and half a dozen more are being negotiated. These are small systems, 100 to 150 MW.

Another technology for new capacity that is of interest to utilities is the combination coal gasification plant/combined cycle generating system. A prototype is successfully operating on the Southern California Edison system, but so far no one has ordered a second.

A third new technology touted for new coal-fired capacity is the supercritical pulverized coal system—a technology well established in the '60s but then largely abandoned due to the poor reliability of early units. A reappraisal of the supercritical boiler led by EPRI has done much to repair its reputation and re-establish it as a viable choice for new capacity.

Nuclear technology development is primarily aimed at improving operating reactors. With little prospect for new nuclear plant orders in the foreseeable future, the emphasis will be on the plants now operating and those in the final stages of construction. Life extension, capacity-factor improvement, and extended fuel burnup are examples of the programs currently underway.

The prospects for exotic forms of energy production such as wind machines are dubious with the expiration of federal tax credits at the end of 1985.

The drive to convert existing oil-fired capacity to burn coal has suffered a temporary lull due to the precipitous drop in residual oil prices in 1985 and the prospect of continued low oil prices. Oil-fired utilities like Boston Edison have shelved conversion plans. Others, like Florida Power & Light, have, temporarily at least, lost interest in technologies such as coal-water fuels that could be burned in oil-design units. Work on coal-water fuels will continue in 1986 but large-scale commitments are doubtful until the price gap between coal and oil increases significantly.

Long-term, the price differential is expected to change in coal's favor and coal's share of electricity production is expected to rise from today's 60 percent to 70 percent by the end of the century.

The looming threat of acid rain regulations is spurring a good deal of technological development aimed at developing retrofit control methods.

The cost of coping with such requirements by retrofitting conventional scrubbers to old power plants or by switching to low sulfur coal in those plants would be huge. A better way to deal with acid rain would be a retrofit emission control method that might not be 90 percent efficient, but would cost substantially less.

Current research and development work is looking at technologies like injecting alkali reagents such as limestone into the furnaces of older plants. The alkali reacts with SO_2 forming a particulate that can be collected in the existing precipitator. Other research teams are investigating injection of sorbents in the ductwork between the air heater and the precipitator.

Successful development of cheap emission control techniques could lead to adoption of legal requirements to use them.

On the T&D side, development work continues on new technologies such as distribution automation, load management, and fiber optic data transmission. The fiber optic data technology is also a part of the budding utility diversification movement. Like railroads, some electric utilities have discovered the commercial possibilities of using their long-distance rights-of-way for installing new data link technology.

Summary

For 1986 and the following four years, it seems that utilities will concentrate on strategies that avoid construction of new, high-cost generating facilities, to avail themselves of low-cost purchased power from other sources and to reduce capital requirements. They also will focus system technological system development on those disciplines that offer the greatest probability of improving system productivity and reducing risk.

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